

## C L A I M S

1. Process for preparing alkylaryl hydroperoxide containing product, which process comprises:
  - (a) oxidation of an alkylaryl compound to obtain reaction product containing alkylaryl hydroperoxide,
  - (b) contacting with water at least part of the alkylaryl hydroperoxide containing reaction product obtained in step (a) which reaction product contains less than 0.05 %wt of sodium,
  - (c) separating the product of step (b) into a hydrocarbonaceous phase containing alkylaryl hydroperoxide and an aqueous phase,
  - (d) optionally repeating process steps (b) and (c) one or more times,
  - (e) contacting at least part of the hydrocarbonaceous phase containing alkylaryl hydroperoxide obtained in step (c) or (d) with olefin and catalyst to obtain alkylaryl hydroxide and oxirane compound, and
  - (f) separating at least part of the oxirane compound from the alkylaryl hydroxide.
2. Process according to claim 1, in which process reaction product containing alkylaryl hydroperoxide obtained in step (a) is subjected to distillation at reduced pressure to remove light compounds, before the reaction product containing alkylaryl hydroperoxide is sent to step (b).
3. Process according to claim 2, in which process the product sent to step (b) further contains less than 0.05 %wt of potassium.
4. Process according to claim 3, in which process steps (b) and (c) are carried out with the help of an extraction column.

5. Process according to claim 4, which process further comprises distillation of the reaction product obtained in step (c) or (d), and sending to step (e) hydrocarbonaceous phase from which light compounds have been distilled off.
6. Process for preparing an alkenyl aryl, which process comprises preparing an alkylaryl hydroxide with the help of the process according to claim 5, which process further comprises:
  - (g) converting at least part of the alkylaryl hydroxide obtained in step (f).
7. Process according to claim 1, in which process the product sent to step (b) further contains less than 0.05 %wt of potassium.
8. Process according to claim 7, in which process steps (b) and (c) are carried out with the help of an extraction column.
9. Process according to claim 8, which process further comprises distillation of the reaction product obtained in step (c) or (d), and sending to step (e) hydrocarbonaceous phase from which light compounds have been distilled off.
10. Process for preparing an alkenyl aryl, which process comprises preparing an alkylaryl hydroxide with the help of the process according to claim 9, which process further comprises:
  - (g) converting at least part of the alkylaryl hydroxide obtained in step (f).
11. Process according to claim 1, in which process steps (b) and (c) are carried out with the help of an extraction column.
12. Process according to claim 11, which process further comprises distillation of the reaction product obtained in step (c) or (d), and sending to step (e)

hydrocarbonaceous phase from which light compounds have been distilled off.

13. Process for preparing an alkenyl aryl, which process comprises preparing an alkylaryl hydroxide with the help of the process according to claim 12, which process further comprises:

(g) converting at least part of the alkylaryl hydroxide obtained in step (f).

14. Process according to claim 1, which process further comprises distillation of the reaction product obtained in step (c) or (d), and sending to step (e)

hydrocarbonaceous phase from which light compounds have been distilled off.

15. Process for preparing an alkenyl aryl, which process comprises preparing an alkylaryl hydroxide with the help of the process according to claim 14, which process further comprises:

(g) converting at least part of the alkylaryl hydroxide obtained in step (f).

16. Process for preparing an alkenyl aryl, which process comprises preparing an alkylaryl hydroxide with the help of the process according to claim 1, which process further comprises:

(g) converting at least part of the alkylaryl hydroxide obtained in step (f).